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THE Chemist

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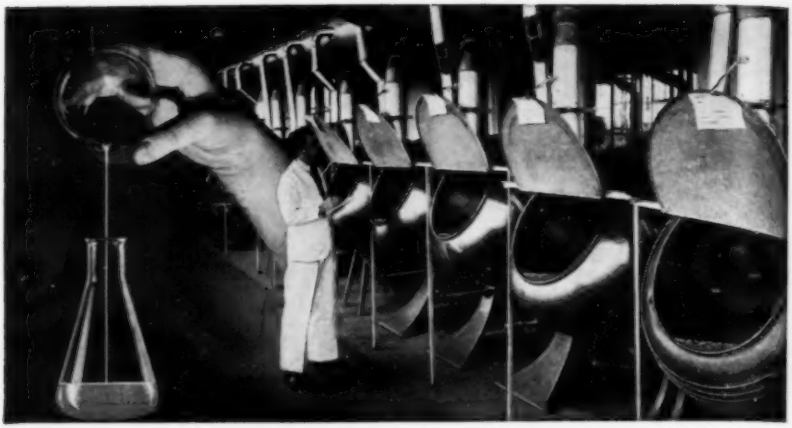

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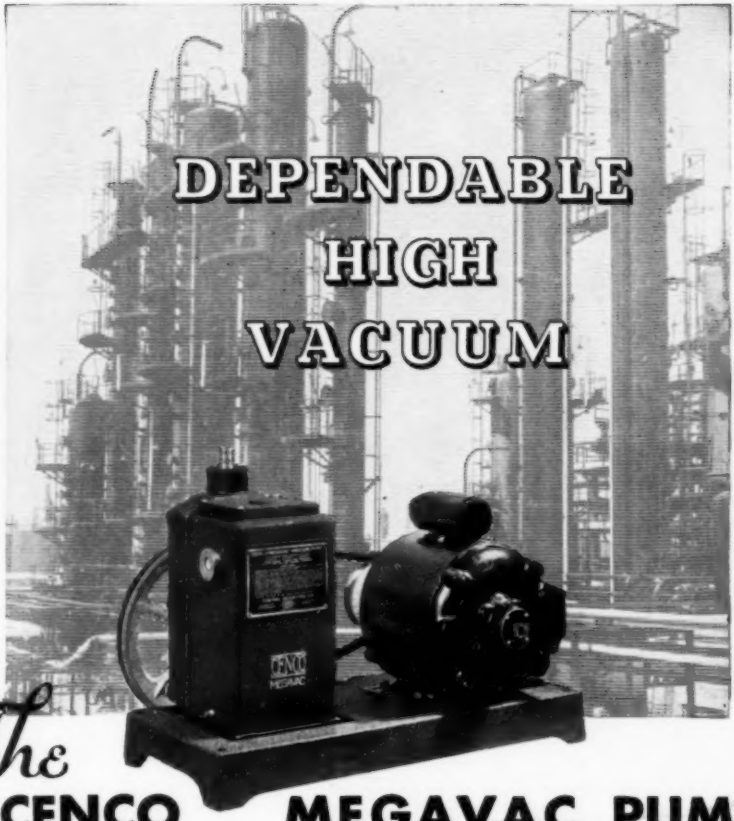

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The Chemist

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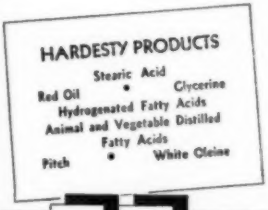

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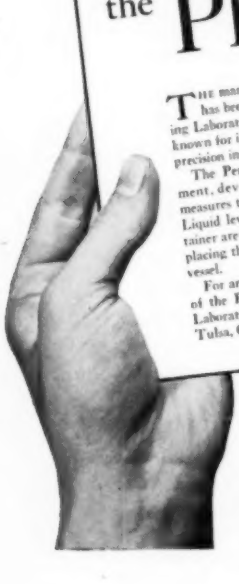

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Why Not U. S. Too?

Raymond E. Kirk, F.A.I.C.

Head, Department of Chemistry and Dean of Graduate School, Polytechnic Institute of Brooklyn

TRAINING for leadership in the technologies is attracting the attention of a great many countries. Many educational missions from foreign countries are now in the United States surveying possibilities here for advanced training for the ablest graduates of their colleges and universities.

The Government of India has recently sent a special educational representative to be resident in the United States. Five hundred students a year are to be sent by India for three years. This will mean eventually that 1500 students from India will be pursuing scientific work in the graduate schools of the United States of America.

The Government of Norway has similar plans. The Soviet Union is planing a large graduate school program in the United States. The countries of South America with or without Government subsidies are sending many graduate students to the United States. In each of these countries there is clear recognition of the leadership that the United States is bound to exercise in all fields of education, but particularly at the graduate level.

Each loyal citizen of the United States will rejoice that our graduate schools are to have this opportunity to help re-light the torch of learning in the world. We are proud to know that the world recognizes our leadership in science and technology. We have here a remarkable opportunity to aid in the reconstruction of all the countries of the world. We welcome these chances for building friendship around the globe.

But the question is bound to come to the mind of each loyal citizen, "Why not the United States too?" The story of what is happening to the "seed corn" for the rebuilding of our own science and industry is too well known to need undue repetition or repeated documentation. Under the Selective Service Act, as it is new administered, only those of our own young men who are classified 4F are permitted to qualify to enter graduate school. At the present time, Selective Service is engaged in winnowing this group again to get men for limited service. The protests of

scientific and engineering organizations have not been heeded. The sadly inadequate provisions of the McDonough Bill seem unlikely to be written into law. Even if the bill is passed, it would not begin to make up our educational deficit. Why should we be less forsighted than India, or Russia, or Norway. Why is it not possible to have our own plans for graduate students in science and technology? Why not U. S. too?

The writer is informed that in England the Armed Services maintain an office at each University known as the Joint Recruiting Board. If a student is recommended by the Faculty as showing unusual promise, the board *reserves* him (not *defers* him.) for scientific work. This procedure has not only maintained the usual steady flow of students into all sciences but has been used to increase the number who have entered physics and engineering. One physicist put it this way. "We would not permit a promising young research man to enlist for combat duty". Our English allies are to be commended for their judgment and their foresight. Why not U. S. too?

Much less certain information seems available regarding Russian procedures. However, all available evidence points to a marked increase in scientific training at high levels during the war. Research in both pure and applied science has gone on without interruption. Why not U. S. too?

The only possible source now left in this country for graduate students is from among those young men not fit for combat duty. Now these men are being drafted for limited service without any regard to their potential usefulness in the years to come. Why should the protests of scientists and engineers be so completely overruled? Perhaps we are considered to be only another "pressure group." If so we must take great pains to establish our position. We speak only because of our zeal for the future of our country. We know the steps that are being taken by other countries to provide a steady flow of able and well trained young persons into science and industry. We only ask again, why not U. S. too?

J. T. Baker Adds to Research Staff

The J. T. Baker Chemical Company, Phillipsburg, New Jersey, announces the addition of John Burton, as design chemical engineer, and Augustus Buzas, as development engineer, to its organic research staff. Mr. Burton was formerly with Heyden Chemical Company, and Mr. Buzas was previously with Merck and Co., Inc. Dr. Joseph R. Stevens directs the Baker research staff. Miss Jeanne Ossent was appointed technical librarian.

An Act to Regulate the Practice Of Chemistry in Illinois

Arthur Schroder, Executive Director

The American Institute of Chemists

THE just recently enacted Senate Bill No. 55, which amended the State Civil Service Law of 1905, eliminated all educational requirements requisite to Illinois state examinations. Licenses, however, may be required in professional fields which have licensing laws — fields such as the medical, dental, pharmaceutical, veterinarian, legal, etc. While that law was amended to aid returning veterans—something we all want to do and will do—it inadvertently permits anyone to practice chemistry regardless of the educational and technical qualifications. The effects of such a law on the life, health, and property of the state can be readily imagined.

As of today, the chemist is not recognized under the law. If he is to have the legal protection granted to doctors and lawyers, etc., he must be licensed under a state law defining his status. House Bill 719 corrects this situation and defines the status of the chemist. It protects the interests of the chemist regardless of whether he be in civil service, teaching, industry or in any other professional chemical activity.

The bill is modelled after the New York State Chemists Licensing Act proposed by THE AMERICAN INSTITUTE OF CHEMISTS in cooperation with the New York State Board of Regents. It is also based upon the recently enacted Illinois Professional Engineers Act which had been so thoroughly studied by the Engineers and the Illinois Engineering Council. The Bill was also discussed with the Director of Education and Registration, with members of the Department of Health and of the Legislative Research Council of the State of Illinois; and with the Secretary of the Illinois Pharmaceutical Association. The benefits of their experience and cooperation was obtained. A similar bill is being considered for Ohio.

A licensing law protects the public and the profession against dishonesty as well as incompetence. Under this registration act, the perpetrator of deceit would be subject to criminal prosecution by the courts and revocation of his license. If this licensing legislation is passed, the chemist will

be classified definitely as a professional man.

During the last few years many laboratory technicians have taken over positions in chemical laboratories because of the shortage of better trained personnel. For the protection of the public and the employer, as well as the man who has devoted many years to his schooling, some distinction must be made between these routine laboratory technicians and the professional chemist. The legislation now proposed does not seek to deprive these technicians of employment. It does however, provide that such persons must work under the competent supervision of a licensed professional chemist, until such time as they may qualify as professional chemist, if they so desire.

Bill 719 sets up high standards and qualifications for the practice of professional chemistry and safeguards the life, health, and property of the state.

In the interest of the public and himself every Illinois chemist should send his views on this bill to his representatives in the Illinois General Assembly at Springfield.

We would appreciate your critical comments on the bill and suggested changes in your own language.

ILLINOIS HOUSE BILL NO. 719

(Following is a copy of the Illinois House Bill No. 719 with the proposed amendments indicated in italics. These amendments have been discussed with and are recommended by the Director of the Department of Education and Registration. They are considered advisable merely to facilitate the administration of the Act by the Department of Education:)

Introduced by Mr. Virkus, May 22, 1945
Read by title, ordered printed and referred to Committee on Judiciary.

A BILL

For an Act to regulate the practice of Professional Chemistry.

Be it enacted by the People of the State of Illinois, represented in the General Assembly:

Section 1. In order to safeguard life, health and property, any person practicing or offering to practice professional chemistry is required to submit evidence that he is qualified so to practice and be registered as hereinafter provided. It is unlawful for any person not so registered to practice or offer to practice professional chemistry in this State, or to use in connection with his name or otherwise assume, use, or advertise any title or description implying that he is a Registered Professional Chemist.

Sec. 2. For the purpose of this Act, the following defintions apply:

(1) A person "practices professional chemistry," within the meaning of this Act, who applies the principles and data of chemistry in any of its branches

or phases in determining, governing or regulating the welfare of individuals or of industry, or in the exposition of such principles in any oral or written report or in any procedure.

(2) "Professional Chemist" means any person who carries out chemical procedures or who offers to or who undertakes to carry out such procedure or to act as a competent adviser in any branch or phase of chemistry such as agricultural, analytical, biological, electro, metallurgical, nutritional, pharmocological, physical, sanitary, synthetic, either organic or inorganic, or who assumes responsible supervision in any branch of chemistry or who performs any professional service involving the application of chemical principles and data.

(3) "Registered Professional Chemist" means a professional chemist registered under this Act.

(4) "Department" means the Department of Registration and Education.

(5) "Director" means the director of the Department of Registration and Education.

(6) "Committee" means the Examining Committee provided for by this Act.

(7) "Approved Chemical College" means a school, college, university, department of a university or other educational institution, reputable and in good standing in accordance with rules prescribed by the Department, and which grants baccalaureate degrees in chemistry or their equivalent.

Sec.3 Exemption: The practice and acts described in paragraphs (1)-(8) inclusive of this Section are exempt from this Act.

(1) The practice of medicine as defined in the "Medical Practice Act", approved June 30, 1923, as amended.

(2) The practice of dental surgery and dentistry as defined in "An Act to regulate the practice of dental surgery and dentistry in the State of Illinois, and to repel certain Acts therein named," approved June 11, 1909, as amended.

(3) The practice of veterinary medicine as defined in "An Act to regulate the practice of veterinary medicine and surgery in the State of Illinois," approved April 24, 1899, as amended.

(4) The practice of bacteriology as defined in "The Illinois Professional Bacteriologist Act",* enacted by the Sixty-fifth General Assembly.

(5) The practice of pharmacy as defined in "An Act to regulate the practice of pharmacy in the State of Illinois, to make an appropriation therefor, and to repeal certain acts therein named", approved May 11, 1901, as amended.

(6) The practice of a person not a resident of and having no established place of business in this State, practicing or offering to practice professional chemistry when such practice does not exeed in the aggregate more than thirty days in any calendar year, if such person is legally qualified by registration to practice professional chemistry in some other state or country in which the requirements and qualifications for obtaining a certificate of registration are not lower than those specified in this Act, provided that such state or country

*This is a companion bill to be considered at the next session of the House beginning Jan. 1st, 1947.

has a corresponding Act enabling Registered Professional Chemists of the State of Illinois to practice within said state or country.

(7) The practice of a person who has, within the preceding year, become a resident, has practiced or offered to practice professional chemistry, and who has filed with the Department an application for a certificate of registration and has paid the fee required by this Act, if such person is legally qualified by registration to practice professional chemistry in some other state or country in which the requirements and qualifications for obtaining a certificate or registration are not lower than those specified in this Act: provided that such state or country has a corresponding Act enabling Registered Professional Chemists of the State of Illinois to practice within said state or country. Such practice shall be permitted only for such time as the Department requires for the consideration of the application for registration.

(8) The work of an employee or a subordinate of a person holding a certificate of registration under this Act, or an employee of a person practicing lawfully under paragraphs (5) and (6) of this Section: provided such work is done under the supervision of a person holding a certificate of registration under this Act or a person practicing lawfully under said paragraphs.

(9) The practices of officers and employees of the Government of the United States while engaged within this State in the practice of the profession of chemistry for said Government.

Sec. 4. The Department shall exercise, subject to the provisions of this Act, the following functions, powers and duties:

(1) conduct examinations to ascertain the qualifications of applicants for certificates of registration as professional chemists, and pass upon the qualifications of applicants for reciprocal licenses, certificates and authorities;

(2) prescribe rules for a method of examination of applicants;

(3) prescribe rules and regulations defining what shall constitute an approved chemical college, reputable and in good standing, and to determine whether or not a chemical college is reputable and in good standing by reference to a compliance with such rules and regulations, and to terminate the approval of such chemical college as reputable and in good standing for non-compliance with such rules;

(4) conduct hearings or proceedings to refuse to issue, to suspend, revoke or refuse renewal of certificates of persons applying for registration or registered under the porvisions of this Act and to refuse to issue, revoke or refuse to renew such certificates;

(5) formulate rules as may be required to administer this Act.

None of the foregoing functions, powers or duties enumerated shall be exercised by the Department except upon the action and report in writing of the Committee which shall be composed of persons designated by the Director to take such action and to make such report.

The action or report in writing of the majority of the Committee shall be sufficient authority upon which the Director may act. Whenever the Director is satisfied that substantial justice has not been done in an examination or hear-

ing he may order a re-examination or a hearing by the same Committe or by a Special Committee consisting of five registered professional chemists, designated by the Director, each of whom has the qualifications required by Section 5.

Sec. 5. The Committee shall consist of *five* professional chemists appointed by the Director, each of whom shall be a professional chemist qualified for registration under this Act and in addition shall:

(1) be a citizen of the United States;

(2) be a resident of this State;

(3) have had not less than twelve (12) years of experience in the practice of professional chemistry;

(4) have been in charge of professional chemical work for at least five (5) years, provided that, for the purpose of this section, any period in which a person has been teaching chemistry, with the rank of assistant professor, or higher, in an approved chemical college, shall be considered as time in which such person was in charge of professional chemical work.

In making the appointment of persons to the Committee, the Director shall give consideration to recommendations by members of the profession and by organizations therein.

Sec. 6. The records of the Department shall be prima facie evidence of the proceedings of the Department set forth therein, and a transcript thereof certified by the Superintendant of Registration shall be admissible in evidence with the same force and effect as if the original were produced.

Sec. 7. A person is qualified to receive a certificate of registration as Registered Professional Chemist who

(1) is of good moral character and temperate habits, and

(2) is at least twenty-five (25) years of age, and

(3) successfully passes a written, or written and oral examination designed to show knowledge and skill equivalent to that attained through graduation from an approved chemical college, and

(4) has had at least twelve years of experience in professional chemistry, under the supervision of a Registered Professional Chemist, or was graduated from an approved chemical college and has had four years or more of experience in professional chemistry under the supervision of a Registered Professional Chemist, and passes a written or written and oral examination specified under (3) above.

In considering the qualifications of applicants, the alternate requirements as set forth in Section 8 shall be considered.

Sec 8. The following shall be considered as alternate qualifications of applicants:

(1) The satisfactory completion of each one-fourth of the total hours of academic credit required for the awarding of a baccalaureate degree in chemistry by an accredited chemical college shall be considered as equivalent to two years of professional chemical experience, as required by Section 7 (4), provided that undergraduate educational credit shall not be accepted in lieu of more than six years of professional chemical experience when such credit does not result in the granting of a baccalaureate degree in chemistry.

(2) The satisfactory completion of each year of chemical study as a graduate student in the Graduate Chemical Department of an approved chemical college, subsequent to the earning of the baccalaureate degree in a field of professional chemistry, shall be considered as equivalent to two years of professional chemical experince, but graduate educational credit shall not be accepted in lieu of more than two years of professiontal chemical experience as required by Section *7*.

(3) Teaching professional chemical subjects in an approved chemical college shall be considered as experience in professional chemistry.

Sec. *9*. Applications for registration shall

(1) be on forms prescribed and furnished by the Department;

(2) contain statements made under oath showing the applicant's education and a detailed summary of his technical work, and

(3) contain not less than five references, of whom three or more shall be Registered Professional Chemists having personal knowledge of his professional chemical experience.

(4) shall be accompanied by the fee for registration as provided in Section *26*.

Sec. *10*. Examinations provided for by this Act shall

(1) be conducted under rules prescribed by the Department,

(2) be held not less frequently than semi-annually, at times and places prescribed by the Department, of which applicants shall be notified by the Department in writing, and

(3) shall embrace such subjects as may be required of candidates for baccalaureate degree in chemistry and to establish whether or not the applicant has the professional chemical experience as required by Section *7*.

Sec. *11*. A Certificate of Registration shall be issued by the Department upon payment of the proper registration fee to any applicant who has satisfactorily met all of the requirements of this Act. The certificate of registration shall authorize the practice of "Professional Chemistry", show the full name of the registrant, have a serial number, and be signed by the Director.

The issuance of a certificate of registration by the Department shall be prima facie evidence that the person named thereon is entitled to all of the rights and privileges of a registered professional chemist, while the certificate remains unsuspended, unrevoked or unexpired.

Each registrant shall, upon registration, obtain a seal of the design authorized by the Department bearing the registrant's name and the legend, Registered Professional Chemist of Illinois". Reports and data rendered as professional services by a Registered Professional Chemist shall be stamped with such seal, during the life of the registrant's certificate, but it is unlawful for anyone to stamp or seal any documents with such seal after the certificate of the registrant named thereon has expired or during any period in which his certificate is suspended or revoked.

Sec. *12*. Each Registered Professional Chemist who continues in active practice shall, annually, on or before July 1 renew his certificate or registration

and pay the required renewal fee. Every certificate of registration which has not been renewed on or before July 1, or during the month of July, shall expire on August 1 of that year. A Registered Professional Chemist whose certificate of registration has expired may have his certificate restored only upon payment of all lapsed renewal fees and also upon payment of the required restoration fee, provided not more than five years have elapsed since the date of expiration.

Any Registered Professional Chemist who has permitted his certificate to expire for more than five years may have his certificate restored by making application to the Department and filing proof acceptable to the Department of his fitness to have it restored and by paying the required restoration fee. However, any Registered Professional Chemist whose certificate has expired while he was engaged in

(1) federal service on active duty with the armed forces of the United States, including the United States Merchant Marine and the United States Coast Guard, or

(2) training or education under the supervision of the United States preliminary to induction into military service, may have his certificate of registration restored without paying any lapsed renewal fees or restoration fee or passing any examination, if within one year after termination of such service, training or education, other than by dishonorable discharge, he furnishes the Department with an affidavit to the effect that he was so engaged and that his service, training or education was so terminated.

Sec. *13.* (1) At any time within one year after this Act becomes effective upon application therefor, and the payment of the registration fee as provided for in Section *26*, the Department shall issue a certificate of registration, without oral or written examination, to any professional chemist who submits evidence, under both, satisfactory to the Committee that he is of good moral character and temperate habits, is at least twenty-five (25) years of age, has been a resident of the State of Illinois for at least one year immediately preceding the date of his application, and was practicing professional chemistry for at least five years at the time this Act becomes effective.

(2) Any person who, at the effective date of this Act, is on active duty with the armed forces of the United States, including the United States Merchant Marine, or is in training or education under the supervision of the United States preliminary to induction into active military service, shall at any time within one year after such active military service or such training or education is terminated, uponapplication therefor, and the payment of the registration fee as provided in Section 26 be entitled to receive a certificate of registration without oral or written examination, if he submits evidence, under oath, satisfactory to the Committee that he is of good moral character and temperate habits, was a resident of the State of Illinois, and that he was practicing professional chemistry for at least five years* at the time of entering such service or training.

Sec. *14* The Department shall, upon application therefor and upon the recommendation of the Committee and the payment of the fee as provided for

*Original bill specified only one year.

in Section 27, issue a certificate of registration to any professional chemist who holds an unexpired certificate of registration issued to him by any State or Territory or Possession of the United States, or of any country, provided that (1) the requirements for the registration of professional chemists under which the certificate or registration was issued do not conflict with the provisions of this Act, (2) the requirements for the registration of professional chemists under which the certificate of registration was issued are substantially equal to those specified in Section *7* and 3 the particular State or Territory or Possession of the United States, or country extends similar privileges to persons registered under this Act.

Sec. *15.* After this Act has been in effect one year, the Department shall issue certificates of registration without examination only as provided for in Section *13* or Section *11* hereof.

Section *16.* The Department may either refuse to issue, or may suspend or voke any certificate of registration for any one, or any combination of the following causes:

1. The practice of any fraud or deceit in obtaining or attempting to obtain a certificate of registration;

2. Any gross negligence, incompetency or misconduct in the practice of professional chemistry as a registered professional chemist;

3. Conviction of a felony;

4. Being declared insane by a court of competent jurisdiction and not thereafter having been lawfully declared sane;

5. Failure to comply with any of the provisions of this Act or any of the rules of the Department pertaining thereto.

Sec. 17. The Department may upon its own mtion and shall upon the sworn complaint in writing of any person setting forth charges which, if proved would constitute grounds for refusal, suspension or revocation of a certificate as hereinabove set forth, investigate the actions of any person holding or claiming to hold a certificate.

The Department shall, before refusing to issue, suspending or revoking any certificate, at least ten days prior to the date set for the hearing, notify the applicant or holder of the certificate, in writing of any charges made, and shall afford him an opportunity to be heard in person or by counsel in reference thereto. Such notice may be served by its delivery personally to the accused person, or by mailing it by registered mail to the place of business last theretofore specified by the accused person in his last notification to the Department At the time and place fixed in the notice, the Committee shall proceed to hearing of the charges and both the accused person and the complainant shall be accord ample opportunity to present in person or by counsel, such statements, testimony, evidence and argument as may be pertinent to the charges or to any defense thereto. The Committee may continue such hearing from the time time. If the Committee is not sitting at the time and place to which the hearing has been continued, the Department may continue the hearings for a period not to exceed thirty days, and notice in writing shall be given to all parties in

interest of the date and hour to which the hearing has been continued, and the place at which it is to be held.

Sec. *18*. The Department has power to subpoena and bring before it any person in this State and to take testimony, either orally or by deposition, or both, with the same fees and mileage and in the same manner as prescribed by law in judicial procedure in civil cases in courts of record of this State.

The Director, Assistant Director of the Department and any member of the Committee has power to administer oaths to witness at any hearing which the Department is authorized by law to conduct.

Sec. 19. Any circuit or superior court, or any judge thereof, upon the application of the accused person or complainant or of the Department, may, by order duly entered, required the attendance of witnesses and the production of relevant books and papers before the Department in any hearing relative to the application for or refusal, suspension or revocation of a certificate, and the court or judge may compel obedience to its or his order by proceedings for contempt.

Sec. *20*. The Department, at its expense, shall provide a stenographer to take down the testimony and preserve a record of all proceedings at the hearing of any case wherein a certificate is refused, revoked, or suspended. The notice of hearing, complaint and all other documents in the nature of pleadings and writen motions filed in the proceedings, the transcript of testimony, the report of the Committee and he orders of the Department shall be the record of such proceedings. The Department shall furnish a transcript of such record to any person interested in such hearing upon payment therefor of twenty-five cents per one hundred words for each original transcript and eight cents per one hundred words for each carbon copy thereof ordered with the original: provided, the charge for any part of such transcript ordered and paid for previous to the writing of the original record therof shall be eight cents per hundred words.

Sec. *21*. After the completion of any hearing under Section *19*, the Committee shall present to the Director a written report of its findings and recommendations. A copy of the report shall be served upon the accused person, either personally or by mailing it by registered mail to the place of business last therefore specified by the accused person in his last notification to the Department. Within twenty days after such service, the accused person may present to the Department his motion in writing for a rehearing, which motion shall specify the particular grounds therefor. The committee shall consider any motion for a rehearing so filed and shall grant or deny such motion within twenty days after the receipt thereof by the Department. In case the motion for rehearing be granted, the Committee shall proceed as promptly as possible to consider the matters presented by such motions, and shall hold such further hearing or hearings, pursuant to the provisinos of Sectinon *19* so far as applicable, as the Committee shall deem advisable. Upon the completion of such rehearing, the Committee shall present to the Director a written report of its findings and recommendations on rehearing.

In the event no such motion for rehearing be filed, then upon the expiration

of the time specified for filing a motion for rehearing, or in the event such motion be filed and denied, then upon such denial, the Director shall enter an order in accordance with the recommendations of the Committee. In the event such motion be filed and a rehearing granted, then upon receipt of the Committee's finding and recommendations on rehearing, the Director shall enter an order in accordance therewith.

If the accused person orders and pays for a transcript of the record the time elapsing thereafter and before the transcript is ready for delivery to him shall not be counted as part of such twenty days.

At the expiration of the time specified for filing a motion for rehearing, the Director has the right to take the action recommended by the Committee. Upon the suspension of revocation of his certificate of registration, a registrant shall be required to surrender his certificate of registration to the Department and upon his failure or refusal so to do, the Department has the right to seize it.

Sec. *22.* At any time, after the suspension or revocation of any certificate, the Department may restore it to the accused person without examination, upon the written recommendaion of the Committee.

Sec. *23. The* circuit or superior court of the county wherein the accused person resides has power to review any order of revocation or suspension and all questions of law and fact thereby by writ of certiorari to the Department. If the accused person is not a resident of this State and the venue is not otherwise fixed herein, the venue shall be in Sangamon County.
The writ shall be issued by the clerk of the court upon praecipe and it shall be served at least ten days before the return day thereof. Service upon the Director or Assistant Director of the Department shall be service on the Department. Such proceedings shall be commenced within twenty days of the accused persons receipt of notice of the order of refusal, revocation or suspension.

The Department shall not be required to certify the record of its proceedings unless the accused person first pays to it the sum of five cents per one hundred words of the record. Exhibits shall be certified without cost.

No Department order of refusal, suspension or revocation shall be set aside or vacated on any ground not specified in the motion for rehearing; provided, that if no motion for rehearing has been filed by the person whose certificate of registration has been revoked or suspended, the court may consider any question which could properly have been raised by a motion for rehearing, and may base its order upon such ground or grounds.

Sec. *24.* An order of refusal to issue, revocation or suspension, or a certified copy thereof, over the seal of the Department and purporting to be signed by the Director shall be prima proof that:

1. Such signature is the genuine signature of the Director;
2. Such Director is duly appointed and qualified;
3. The Committee and the members thereof are qualified to act;

An order of refusal, revocation or suspension shall be conclusive proof that all precedent and concurrent acts of Department officers and of the Committee

necessary of the validity of the order were pursuant to authority conferred by the Director.

Sec. *25*. Appeals from all final orders and judgments entered by a circuit or superior court in review of an order of the Department may be taken directly to the Supreme Court by either party to the action within sixty days after service of a copy of the order or judgment of the circuit or superior court, and shall be governed by the rules applying to other civil cases appealed to the Supreme Court, except that formal pleadings shall not be required.

The pendency of an appeal or writ of certiorari shall not of itself stay or suspend the operation of an order of refusal, revocation or suspension; but during the pendency of such suit or appeal, the circuit or superior court, or the Supreme Court, as the case may be, in its discretion, may stay the operation of such order in whole or in part upon such terms and conditions as the court may prescribe. No such stay shall be granted by the court otherwise than upon ten days' notice to the Department and after a hearing.

Sec. *26*. The fee to be paid by an applicant upon filing his application for registration when examinations are required is twenty dollars ($20.00). An applicant failing to pass an examination may apply for reexamination at the expiration of six months and will be reexamined without payment of additional fee. The fee to be paid for subsequent examinations to determine his fitness to receive a certificate of registration is ten dollars ($10.00).

The fee to be paid by an applicant upon filing his application for registration under Section *13* is ten dollars ($10.00).

The fee to be paid by an applicant upon filing his application for registration under Section *14* is ten dollars ($10.00).

The fee to be paid for the renewal of a certificate of registration is three dollars ($3.00).

The fee to be paid for the restoration of a certificate of registration which has expired for not more than five years is five dollars ($5.00).

The fee to be paid for the restoration of a certificate of registration which has expired for more than five years is fifteen dollars ($15.00).

The fee to be paid for the issuance of a duplicate certificate of registration is five dollars ($5.00).

Sec. *27*. Each of the following is punishable by a fine of not less than one hundred dollars ($10.00), nor more than five hundred dollars ($500.00), or imprisonment in the county jail for a period of not exceeding three months, or both.

(1) The practice, or offer to practice, professional chemistry in this State without a certificate of registration as a professional chemist;

(2) The presenting, or attempting to use, as his own, the certificate of registration or the seal of another;

(3) The submitting of false or forged evidence of any kind to the Department in obtaining a certificate of registration;

(4) The false impersonation of any other registrant;

(5) The use or attempt use of an expired, suspended, or revoked cer-

tificate of registration;

(6) The affixing of a Registered Professional Chemist's seal to any work which has not been done by, or under the personal supervision, of, that Registered Professional Chemist;

(7) The violation of any of the provisions of this Act.

Sec. *28.* The sum of twenty-five thousand dollars ($25,000), or so much thereof as may be necessary, is hereby appropriated, to the Department out of monies in the state treasury not otherwise apprpriated, to defray the expenses of the Department, including personal service, maintenance and operation, in carrying out the provisions of this Act.

All fees, fines and penalties and other monies derived from the operation of this Act shall be paid to the Department and on the fifth day of each month shall be paid by the Department into the state treasury.

Sec. *29.* This Act may be known and cited as "The Illinois Professional Chemistry Act."

NAM Patent Recommendations

R. J. Dearborn, chairman of the Committee on Patents of the National Association of Manufacturers, stated that NAM recommends patent legislation which would contain (1) Recording of all existing and future patent agreements to which one of the parties is a citizen of a foreign country. This should be done in the U. S. Patent Office and not in the Department of Justice, as recommended in several pending bills.

(2) Filing domestic patent agreements in order to assure adherence to anti-trust laws, and to remove the unjustified suspicion that manufacturers are entering into secret agreements contrary to public policy.

(3) Permitting filing of abstracts containing essential facts in order to safeguard competitive information.

Hercules Adds to Staff

Dr. Emil Ott, F.A.I.C., director of research for Hercules Powder Company, announced recently that Dr. Robert W. Cairns has been appointed assistant director of research of Hercules, and Dr. Raymond F. Schultz has been named director of that company's Experiment Station.

General Electric Plans New Laboratory

General Electric Company plans to erect an $8,000,000 laboratory on a 219 acre estate near Schenectady as soon as WPB approval is obtained. It is planned to extend the laboratory staff by several hundred workers. The high elevation of the new laboratory site will permit experiments with radar, jet engines, and other devices.

Wohlleben, F. A. I. C. – A Career of Service

Miriam Haber

Dayton Daily News Staff Writer

ON New Year's Day of 1909, an aristocratic-looking young man of 33 arrived in Dayton. It was not his first visit, as he had been graduated 14 years before from St. Mary's institute, now the University of Dayton. Yet both he and the town had changed so that he barely recognized it. Both had grown and developed. He had added to his years and maturity. To his experience as a student, he had added teaching experience and travel and study abroad. He had left Dayton still a youth; he returned a man, faced by a man-sized job.

With his Ph.D. degree from the University of Fribourg, Switzerland, still fresh in his pocket, Dr. William J. Wohlleben, brother of the Society of Mary, made his way to the grounds of St. Mary's institute, where he had been assigned to build up the chemistry department. Today, at 69, he still heads the department. He has guided over 200 students through the trials and tribulations of earning degrees in chemical engineering, and he remains a friend to most of them,

Dr. Wohlleben was born in Chicago on Jan. 19, 1876. His family had emigrated in the 1850's from Luxembourg, from the tiny village of Wiltz, near the Ardennes forest, where some of his students are now fighting. At 14, he enrolled at St. Mary's institute, which then consisted of four buildings and 50 students. Two years later, he took his first vows in the Society of Mary. Three years after that, he was awarded his Bachelor of Science degree and began his career as teacher.

His teaching carried him to Baltimore, Erie, Pa., and St. Louis. In 1904, he left the teaching profession and went to Fribourg, where he earned his Master's and Doctorate. Returned to Dayton, he tackled the job of expanding an embryonic department of chemistry into a vital, growing concern.

On his first day back in Dayton, Dr. Wohlleben looked over the facilities at hand and found them wholly inadequate. The chemistry laboratory was small, badly lighted, poorly ventilated. It lacked even gas for the heat energy so essential to chemical experiments.

Supplying gas was his first prob-

lem. It took six months for him to do it, but in June, 1909, a gas main was installed and gas was piped onto the grounds for the first time.

During the six-month period, however, Dr. Wohlleben accomplished other things. He had the tiny laboratory windows enlarged. He obtained more floor space. And soon he acquired an assistant, a youth whose name was Matthias Haas. University of Dayton students and alumni know Dr. Haas today as dean of the engineering college,

Dr. Wohlleben now occupies a small but cheerful office adjoining the chemical laboratories and classrooms. In the 35 years he has been there, a constant stream of students and alumni has gone through its door, seeking advice and assistance. They bring their educational problems: what courses to take, how to do a better work. They bring their personal problems, too. How do you get a job? How to finance another year of college? Should a student marry his girl or wait until after graduation?

The personal associations that go with his position are what Dr. Wohlleben likes best. Looking back on a long, rich life, he says that he does not regret going into teaching in preference to becoming exclusively a research chemist. "I like to work with live material," he says.

He does consulting work in organic chemistry, and he has been called upon to prove chemically questions of fact that arise in court trials. He recalls one day when a man brought a sample of water to be tested for traces of alcohol. It was during prohibition, and the prohibition officers had walked into his restaurant just as he poured himself a drink in the kitchen. Quickly, he had dumped the evidence into a dishpan of water, and the restaurant owner wanted tests run to double-check the government's findings.

But the main interest is in his students. He likes to talk to them, to get to know them. He follows their progress eagerly after they leave the university. Each year he sends each graduate a Christmas letter full of news of the university. His students are now spread all over the world. One, William Kinney, led the first B-29 raid over Japan. Kinney wrote Dr. Wohlleben about it. "I piloted the first B-29 over Japan on the night of June 15," he reported. "My ship was the first to drop its load over the target."

His honors are widespread. He is a member of the U. D. athletic board and committee on honorary degree. He is a member of the American Chemical society; fellow of the American Association for the Advancement of Science; fellow of the American Institute of Chemists. He is listed in the 1944 edition of "American Men of Science." His hobby is music.

Evidence of the love his students

hold for him came in 1942, when a group of alumni arranged a dinner in honor of his 50th anniversary in the Society of Mary. The dinner was held at the Biltmore hotel. The theme, of course, was chemistry. Flowers were arranged in beakers of the type used by chemists. The menu was printed in chemical terms. The alumni came from all over the country. Regrets, too, arrived. From Brooklyn a graduate wrote, "Nothing but urgent duties for Uncle Sam could preclude my paying personal tribute to one of the greatest men I know." From Charleston, W. Va., Detroit, Lakeland, Fla., Union, N. J., Pittsburgh, Pa., Chicago, Philadelphia, Louisville, Yonkers, Muncie, Ind., Pine Bluff, Ark., the regrets arrived, from busy U. of D. alumni who had gone out to work in the chemical field, and all echoed the sentiments, "A great man," "Sincerely sorry," "I'll be there in spirit."

They all call him "Doc." But, knowing him, it does not sound disrespectful. He is a warmly human man whose personality rises above his title.

Necrology

Nathan F. Drake

Nathan Franklin Drake, 1st Lt., U. S. Army, was killed in action in France, September 8, 1944.

He was born in 1916 at Missoula, Montana, and was graduated from Drexel Institute of Technology in 1939. He worked in machine development at the Kimble Glass Company during 1939-1941, and then entered the University of Delaware as a Fellow studying in the field of heat transfer under Dr. Allan Colburn, until he entered active service in the Army.

He served in Iceland, England, Ireland and France. He was in action at Caumont, the break-through to Vire, the capture of Angers, the capture of Chartres, the capture of Milly, Forest of Fountainbleau, and Fountainbleau City, and the crossing of the Seine. He distinguished himself in bravery and leadership in the crossings of the Moselle River where the infantry held a bridgehead until units of the Division were able to follow. It was at this bridgehead that he met his death. He was awarded, posthumously, the Purple Heart and the Presidential citation.

He is survived by his wife and a daughter born four months after his death.

He was awarded a Student Medal and Associate membership in THE AMERICAN INSTITUTE OF CHEMISTS by the Pennsylvania Chapter in 1939.

Martin Hill Ittner

Martin Hill Ittner, chief chemist of the Colgate-Palmolive-Peet Company, Jersey City, N. J., died April 22 at Spring Lake, N. J., at the age of 74.

Dr. Ittner was born in Berlin Heights, Ohio, and received the degrees of Ph.B. and B.Sc. from Washington University, St. Louis; the A.M. and Ph.D. degrees from Harvard University, and later the Honorary D.Sc. degree from Colgate University.

From 1894 to 1896 he was an assistant in chemistry at Harvard University. During 1896, he assisted Dr. Walter Gibbs in inorganic chemistry at Newport, Rhode Island. From 1896 to 1928 he was chief chemist at Colgate and Company, Jersey City, and continued as chief chemist from 1928, when the Colgate Company became the Colgate-Palmolive-Peet Company, until the time of his death.

He developed many important processes in connection with soap making methods, including the increased yield of glycerine. He also developed a process for the hydrogenation of fatty oils and held patents in the field of distillation.

The Perkin Medal was awarded to him in 1942 and the Modern Pioneer Award in 1940. He was a former president and treasurer of the American Institute of Chemical Engineers, president of the Chemists' Club, and chairman of the New York section of the American Chemical Society. He became a Fellow of THE AMERICAN INSTITUTE OF CHEMISTS in 1936.

Thomas A. Wright

Thomas Archibald Wright, president of Lucius Pitkin, Inc. 47 Fulton Street, New York, N. Y. died May 25, 1945, of a heart attack at the age of fifty-eight.

Mr. Wright was born in New York City and attended Columbia University. In 1905 he was assistant Assayer for the Delamar Copper Works, Chrome, New Jersey. From 1907-1908 he was chief assayer for United States Metals Refining Company, East Chicago, Ind., and then joined Lucius Pitkin, Inc. as chemist-assayer. He rose successively to chief chemist, secretary of the organization, and then to president, the position which he held until his death. Mr. Wright specialized in the non ferrous metals and was the author of various articles in the field of metallurgy.

He is survived by his widow and two sons, Frederic and Captain Thomas A. Wright of the Marines, and a daughter, Mrs. Harold Mobus.

He became a Fellow of THE AMERICAN INSTITUTE OF CHEMISTS in 1923.

Charles F. Burgess

Charles F. Burgess, president of the Burgeee Battery Company and chairman of the C. F. Burgess Laboratories,Inc. Chicago, Illinois, died February 13, following a heart attack, at the age of seventy-two.

Dr. Burgess was born in Oshkosh, Wisconsin, and received the B. S., Electrical Engineering, and Doctor of Science degrees from the University of Wisconsin. From 1895 to 1913 he taught at the University of Wisconsin where he was professor of chemical engineering until he established the C. F. Burgess Laboratories.

Dr. Burgess was the author of numerous papers and held a number of patents on dry batteries, electrochemistry, electrolytic iron, iron, alloys, corrosion, etc. He specialized in industrial developments and the creation of new industries. Dr. Burgess become a Fellow of THE AMERICAN INSTITUTE OF CHEMISTS IN 1936.

George L. Roberts

George Leathwhite Roberts, chief chemist of United Carbon Company, Inc., Charleston West Virginia, died in March 1945, at the age of forty-seven.

He was born in Camden, N. J. and received the B.S. and M.S. degrees from George Washington University.

Mr. Roberts was the author of a number of technical papers on the subject of carbon black.

He was an instructor at the Geo. Washington University for one year and then joined U. S. Bureau of Standards until 1929. The following year he was research chemist for The Flintkote Company. In 1930 he became chief chemist for the United Carbon Company.

Mr. Roberts became a Fellow of THE AMERICAN INSTITUTE OF CHEMISTS in 1940.

Henry K. McConnell

Henry K. McConnell, vice-president in charge of manufacture, Tobacco By-Products & Chemical Corporation, Richmond, Virginia, died February 25th at the age of fifty-eight..

Mr. McConnell was born in Louisville, Kentucky, and received the B.S. degree from North Carolina State College. In 1911, he was employed as chemist for the Tobacco By-Products & Chemical Corporation, Richmond, Virginia, and progressively rose from chemist to superintendent, and to vice-president in charge of manufacture.

He held a number of patents dealing with nicotine and its production.

He became a Fellow of THE AMERICAN INSTITUTE OF CHEMISTS in January 1945.

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June Meeting

THE 221st meeting of the National Council of The American Institute of Chemists was held on Wednesday, June 20, 1945, at 6:30 p. m. at The Building Trades Employers' Association club rooms, No. 2 Park Avenue, New York, N. Y. with president Gustav Egloff presiding.

The following officers and councilors were present:

Messrs: G. Egloff, H. L. Fisher, F. A. Hessel, R. E. Kirk, H. B. McClure J. M. McIlvain, R. J. Moore, J. F. Muller, E. H. Northey, A. Schroder, and M. Toch.

Mr. T. S. McCarthy and Miss V. F. Kimball were present.

The minutes of the preceding meeting were approved with the exception

of the sentence "Dr. H. L. Fisher reminded the Council that the Professional Engineers have licensing established in 46 states" Dr. Fisher asked that it be changed to read "Dr. Gustav Egloff reminded the Council that the Professional Engineers have licensing established in 46 states".

The treasurer's report was read and accepted.

Two letters containing suggestions for Institute activities were presented, one from F. Sievenpiper and one from J. Ogilvie. Upon motion made and seconded these letters were referred to Dr. E. H. Northey for recommendations.

A letter from Mr. Neiman was read informing the Council that he was unable to be present at the meeting.

A letter from Mr. Louis N. Markwood, chairman of the Washington Chapter, containing a report of the action taken by the Washington Chapter concerning federal classifications, was presented. After discussion, this letter was referred to a committee of five persons familiar with the Washington situation. Dr. Lundstrom, Dr. Rader, and Dr. May were named to serve on the committee, and the president will appoint two additional members later.

Dr. Fisher brought up the subject of our present code of ethics, most of which seems to apply to consulting chemists. The code of ethics, together with Dr. Fisher's remarks, were referred to the Committee on Ethics. Councilors who have suggestions on the possible re-wording of the code of ethics should send these to Dr. W. D. Turner, chairman of the Committee on Ethics.

Mr. Schroder discussed the attempt of the Chicago Chapter of the Institute to have a licensure bill for chemists adopted by the state of Illinois. A report of the Chicago Chapter's work with regard to this bill appears in this issue of THE CHEMIST.

Upon motion made and seconded Robert L. Taylor was raised from Member to Fellow.

Upon motion made and seconded the following new members were elected.

Fellows

Barr, Maurice O.
Technical Service Representative
The Eagle-Picher Lead Company
Cincinnati, Ohio

Beach, Ralph Moore
Chief Chemist
National Oil Products Company
Harrison, N. J.

Beadle, Buell W.
Research Chemist
American Meat Institute
Research Associate
Department of Pharmacology
University of Chicago
Chicago, Illinois

Bradley, John J., Jr.
Director of Research
Reichhold Chemicals, Inc.
Boston, Mass.

Brown, Alfred Seely
Research Director
Skenandoa Rayon Corporation
Utica, N. Y.

Calkin, John B.
Research Assistant to Exec. Vice-Pres.
Union Bag & Paper Corporation
New York, N. Y.

Grandal, Emma E.
Director of Library Research
Universal Oil Products Company
Riverside, Illinois

Eck, Reinhard
Research and Manufacturing Chemist
United Piece Dye Works
Lodi, N. J.

Farkas, Howard
Vice-President
U. S. Stoneware Company
Akron, Ohio

Fernelius, Willis C.
Assistant Laboratory Director
Monsanto Chemical Company
Dayton, Ohio

Fleyscher, Maurice H.
Research and Development Chemist
National Aniline Division
Allied Chemical & Dye Corporation
Buffalo, N. Y.

Gillies, John H.
Process Engineer
R. C. A. Victor Division
Harrison, N. J.

Greze, John P., Jr.
Bacteriologist
Oakite Products, Inc.
22 Thames Street
New York, N. Y.

Hochwalt, Carroll A.
Central Research Director
Monsanto Chemical Company
Dayton, Ohio

Hopkins, Abner C., Jr.
Technical Service Div.
Commercial Solvents Corporation
New York, N. Y.

Mitchell, Frank S.
Research Chemist
Spencer Kellogg & Sons
Buffalo, N. Y.

North, Gerald C.
Director of Research
Beatrice Creamery Company
Chicago, Illinois

Richter, Richard C.
Head of Industrial Pilot Plant and Laboratory
National Oil Products Company
Harrison, N. J.

Riley, Archibald H.
Associate Materials Inspector
U. S. Maritime Commission
New York, N. Y.

Seymour, Raymond B.
Group Leader
Monsanto Chemical Company
Dayton, Ohio

Sweedler, Benjamin
Patent Attorney
Barrett Division
Allied Chemical & Dye Corporation
New York, N. Y.

Willard, John W.
Assistant Professor
Virginia Military Institute
Lexington, Virginia

Zichis, Joseph
Assistant Chief Bateriologist
Illinois State Health Department
Chicago, Illinois

Members

Ayres, Robert P.
Research Chemist
Oakite Products, Inc.
22 Thames Street
New York, N. Y.

Both, William
Analytical Chemist
Smith-Emery Company
Los Angeles, California

Dewey, Parker F.
Chief Chemist
Hart Leather Finish Corporation
Chicago, Illinois

Jacoby, Marvin
Research Chemist
Hewitt Rubber Corporation
Buffalo, N. Y.

Associates

Raithel, Edward E.
Chemist
Wyckoff Steel Company
Ambridge, Penna.

Stobbart, John B.
Assistant to Manager, Market Devel.
National Oil Products Company
Harrison, N. J.

Life Member

Thomas, John W.
Chairman of Board
The Firestone Tire & Rubber Company
Akron, Ohio

Raised To Member

Covet, Sylvia S.
Promotion Director
WEBC Head of Lakes Broadcasting Company
Duluth, Minn.

Seipt, Willard R.
Research Engineer
Keasbey & Mattison Co.
Ambler, Penna.

Dr. Northey reported that his committee has prepared a list of questions to inform young chemists concerning opportunities available to them by way of information about chemical companies. It was suggested that this report be published in a forthcoming issue of THE CHEMIST, and that Dr. Northey submit his recommendations by mail to the Councilors for approval.

There being no further business, adjournment was taken.

CHAPTERS

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A MEETING of the Chicago Chapter was held on April 13, 1945. The principle speaker of the evening was Dr. E. C. Williams, director of research, General Aniline and Film Company. Dr. Williams spoke on "The Chemist in Management" (see THE CHEMIST, 22, 145 (1945).

After the main talk there was discussion by a panel made up of Mr. M. H. Arveson, Dr. J. A. Bjorksten, Dr. S. M. Cantor, Mr. M. J. Hiler and Dr. A. E. Sidwell. During the discussion, the following points of interest were brought out.

1. In general, chemists tend to leave the laboratory and enter management because managerial positions usually offer better pany and greater presige than laboratory positions.

2. In some instances they are able to insure the development and utilization of their own inventions better as part of management than as a laboratory worker.

3. There is an apparent drop in the number of inventions by chemists after thirty-five years of age. This may well be due to the chemist going into management and concerning himself with executive and administrative tasks at about this age rather than any atrophying of the chemist's inventive faculties.

4. Some chemists are fully capable of being good chemists and good executives. In such cases it may be difficult to decide which way they should go. Other chemists are obviously of most value as research men and will be of most value in the laboratory. Usualy these men know this and would prefer to remain in the laboratary, if the laboratory salaries were on a par with those of management.

5. Those chemists who do enter management should understand their counterparts in the laboratory. This is desirable for the "eccentrics" and "prima donnas" of the profession may produce excellent results when handled properly.

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Walde In Guatemala

Arthur W. Walde, F. A. I. C., is with the U. S. Foreign Economic Administration, as chief chemist in the main Latin American Laboratory at Finca El Porvenir, Guatemala.

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DR. Horace G. Byers, F. A. I. C. addressed a combined meeting of the American Chemical Society and the Pennsylvania Chapter of THE AMERICAN INSTITUTE OF CHEMISTS Wednesday Evening, April 18, 1945 on "Soil Genesis and Some Soil Properties".

A soil is defined as the locus of plant growth or that portion of the earth's solid surface developed from a variable mixture of weathered minerals, and decaying organic matter. Soils may be developed in place from igneous or sedimentary rocks or from transported or alluvial materials. It is to be kept in mind that a mature soil is much more than a mere residue. A major role in soil genesis is played by water, which by surface flow and passage downward and upward through the soil, is the chief agent in the development of soil profiles.

One of the important bases for soil classification is the soil texture or the relative proportions of the various sizes of individual soil grains. For coarse portions (0.2 to 2.0 mm) these proportions may be determined by the use of screens. The finer fractions are determined by sedimentation with the application of Stokes' Law relating to the fall of spherical bodies in viscous media.

The limiting sizes of soil particles for usage in soil texture determinations as used by the U. S. Department of Agriculture follow:

Fine ground	2-1 mm
Coarse sand	1-0.5 mm
Medium sand	0.5-0.25 mm
Fine sand	0.25-0.10 mm
Very fine sand	0.10-0.05 mm
Silt	0.05-0.002 mm
Clay	below 0.002 mm

As an example of typeing a soil with respect to texture, a clay soil

must contain less than 20 per cent of sand. A loam is mechanically more or less midway between sand and clay and may be defined as a mixture of sand, silt and clay particles which exhibits light and heavy properties in about equal proportions. Depending upon the particle size group which predominates, loams are termed sandy loams, silt loams, clay loams, etc.

The greater proportion of soils classified in the United States are loams, which is fortunate, since the loams are most favorable types for crop production.

The unit of study in soil science is the soil profile, which is a section of the soil down to unconsolidated debris above bed rock. This profile is divided into three groups of layers or horizons, designated A, B, and C. The A horizon is commonly subdivided into divisions A_0, A_1, and A_2 according to the amount and type of organic material present. The A horizon is usually appreciably darkened in color by the organic material present and becomes the furrow slice where the land is ploughed. The B horizon or subsoil, in temperate regions three to four feet thick, contains little or no organic matter and is the region of accumulation of iron and aluminum compounds especially.

In arid regions the B horizon generally contains considerable calcium carbonate and gypsum. The C horizon consists largely of fragmented parent rock. The profile of any one soil will probably not show all possible horizons, for obvious reasons; i. e. topographical influences, poor drainage, recently deposited alluvial material, erosion with resulting truncation of the profile, etc. Many farmers today are cultivating the subsoil without realizing the ravages of erosion.

In connection with soil classification, references was made particularly to U. S. Department of Agriculture Yearbook, "Soils and Men", 1938, and the "Monograph on Soil Classification" by C. F. Marbut; "Soils of the U. S. Atlas of American Agriculture", Bureau of Chemistry and Soils, U S. Dept. of Agriculture, 1935, pt. III.

Field studies of soil are based upon texture, feel, and judgement of the surveyor only supplemented by laboratory examination. In field work three categories are commonly recognized: (1) series, (2) type, and (3) phase.

The most important of the field categories is the soil series; i. e., a group of soils having horizons similar as to differentiating characteristics and arrangements in the soil profile and developed for a particular type of parent material. Soil series are named after the geographic locality in which the series was first characterized, such as Chester, Hagerstown, Manor, Landsdale, etc. A soil series is subdivided on the basis

of the texture of the soil. A horizon into soil types. A term such as sand, or sandy loam, or loam, or silt loam, or clay is added to the series name to give the name of the soil type. Examples of soil types are Chester loam, Hagerstown silt loam, etc. In the case of bog soils the word peat or muck, whichever is appropriate, is added to the series name to designate the soil type.

Within a soil type further subdivision is often made into phases, which are subdivisions made on the basis of some important local derivation such as erosion slope, stoniness, or soluble salt content. These local variations mark a departure from a well established normal or key type..

Marbut in his monograph divided soils into two great divisions, pedocals and pedalfers. The pedocals contain accumulated calcium and magnesium carbonates, and are roughly equivalent to soils of the arid and semi-arid regions. The pedalfers are distinguished by the absence of calcium and magnesium carbonate and usually by the accumulation of iron and aluminum oxides. The pedalfers are confined to humid regions.

On the basis of degree of development of definite soil characteristics all soils are divided into three orders: zonal, intrazonal, and azonal. The zonal order being divided into pedocals and pedalfers. The three orders are sub divided on the basis of climatic conditions into suborders, and the suborders are further subdivided into groups of increasing minuteness of differentiation into Great Soil Groups, Families, Series, Types and Phases.

The Zonal order is one in which the soils have well developed characteristics that reflect the generally active factors of soil genesis; i. e., climate and organisms, chiefly vegetation. The zonal order includes soil groups ranging from the arctic tundras to the tropical laterites.

The intrazonal order is one in which in addition to general climate and biological influences, there is a reflection of some local condition; for example, poor drainage, alkali salts, parent material, or age. This order includes soil groups such as salines, peats and rendzinas (developed from relatively soft, highly calcareous parent material).

The azonal order consists of soils without well defined characteristics owing to their youth conditions of parent material, or relief. The azonal order includes illuvials, rocky soils (lithosols or skeletal soils), and sand.

The soils of southeastern Pennsylvania are the Pedalfer Zonal order; Suborder-Light colored podzonized, derived from timbered regions; and of the Group-Grey Brown Podzols.

The Podzol (from Russian for, like ash) soils have an organic surface mat and a very thin organic-

mineral layer above a grey layer which rests upon an illuvial dark brown horizon, developed under coniferous, mixed forest or heath vegetation in a temperate to cold moist climate. The term illuvial refers especially to the movement of soil material, particularly colloids, from one place to another within the soil profile under climatic conditions such that there is an excess of rainfall over evaporation. Iron oxide and alumina and sometimes organics have been removed from the A and deposited in the B horizon of the soil profile. Due to the more rapid removal of basic oxides as compared with the acidic silica, podzols tend to become acidic.

The soil series present in the southeastern Pennsylvania area with respect to Philadelphia are the Sassafras and Collington eastward; west, and southward Hagerstown, with Chester and Manor, northward, the Penn. and Landsdale Series.

The Sassafras and Collington series are derived from unconsolidated beds of sands, sandy clays, clays and from greensand or glauconitic material. The soils are all brown colored, and sandy in texture. The Collington soils differ from the Sassafras solid in having a slightly greenish cast derived from the parent greensand .

The Hagerstown series is derived from limestone, dolomitic limestone and some shale. The limestone in places is very cherty. The dominant texture is of the silt loam and clay loam type.

The Chester and Manor series are derived from strongly metamorphosed rocks — gneiss, schist, with some serpentine, granite, and dark-colored igneous rocks (trap rock), such as diabase, and basalt. The surfaces are generally of the loam type.

The Penn series is derived from red triassic shales and sandstones and the Landsdale series from yellowish grey and grey shales and limestones. The predominant type is silt loam.

It was pointed out by the speaker that there may be danger of soil classification becoming an object of research rather than an aid in research.

The total chemical analysis of soils is of very limited use. Commonly the results of soil analysis are expressed in terms of oxides, although such oxides may not exist free in the soil but in silicates, such as feldspars, kaolein, mica, etc.

Soil colloid size is arbitrarily set at 0.001 mm. or smaller. The greater part of the important properties of the soil, such as moisture relations, fertility, response to cultural treatment, etc. is dependent on the soil colloids. The inorganic part of the soil colloids is a complex mixture of oxides of Si, Al, Fe, Ca, Mg, Ti, K, Na, S, P, with various trace elements. Frequently it is convenient to express analytical results as the molecular rations of silica to combined fer-

ric and aluminum oxides (sesquioxides). For example, if the analysis of a soil colloid shows the presence of 48.86% SiO_2, 7.40% Fe_2O_3, and 22.04% Al_2O_3, then the silica sesquioxide ratio is found as follows:

$$\frac{44.86}{60.3} = 0.7440 \text{ mol. wts. of } SiO_2$$

$$\frac{7.40}{159.7} = 0.04863 \text{ mol. wts. of } Fe_2O_3$$

$$\frac{22.04}{102.0} = 0.2161 \text{ mol. wts. of } Al_2O_3$$

$$\frac{0.7440}{0.0463\text{-}0.2161} = 2.84 = \text{sesquioxide ratio}$$

The two oxides, alumina and iron oxide are the only two oxides in soils, in any considerable quantity, in which the elements are present in the ratio of 2 to 3 or 1 to 1½; hence the term sesquioxide. The sesquioxide ratio is of use in confirming soil classification. For example, podzol soils have a characteristic sesquioxide ratio of approximately 3.26.

Of the various silicates from which soil colloids may be formed the feldspars make up according to the estimate of F. W. Clarke, 60 per cent of the igneous rocks responsible for soil production, while shales and sandstones generally contain much smaller amounts of feldspars. Taking feldspar ($KAlSi_3O_8$ as an example the following equations illustrate what may occur as a result of mineral decay.

(1) $KAlSi_3O_8 + H_2O \rightarrow KOH + HAlSi_3O_8$

(2) $HAlSi_3O_8 + H_2O \rightarrow H_2AlSi_3O_9$

(3) $H_2AlSi_3O_9 + H_2O \rightarrow H_2AlSi_2O_7 + H_2SiO_3$

(4) $H_2AlSi_2O_7 + H_2O \rightarrow H_2AlSiO_5 + H_2SiO_3$

(5) $H_2AlSiO_5 + H_2O \rightarrow Al(OH)_3 + H_2SiO_3$

Ferric feldspars decompose more rapidly than potash feldspars. Reaction 3 would approximate a sesquioxide ratio prevalent in a podzol type of soil formed under the influence of low temperature and high rainfall, and reaction 5 approximates the condition present in laterites (from Latin for, brick like) formed under tropical conditions of high temperature and high rainfall. These laterites form large areas of waste land and forest and are in places mined ofr iron or aluminum oxides.

The complex ferric aluminate silicate mixture, containing, for example, kaolin formed at the various stages of silicate hydrolysis is amphoteric and this can react reversibly with ions from the soil solution, and therefore plays an important role in plant food storage.

For further details on silicate decomposition the audience was referred to U. S. Dept. of Agriculture, Tech. Bull. #319 and 484, and American Soil Survey Assoc. Bull. #14.

The colloidal clay intimately associated with, if not in actual chemical combination with humus forms the colloidal complex of soils. Soil humus represents a stage in the decomposition of soil organic matter brought about largely by various forms of life especially earth worms. The gradual

and rather slow oxidation of humus continually liberates a certain amount of simple mineral compounds in forms available for consumption by growing plants, so that soil humus functions as a soil storage place for mineral plant nutrients and as a regulator of supply to the growing crop. Humus also plays an important role in modifying physical and mechanical properties of the soil, such as structure, color cohesion, and moisture holding capacity. For information on soil humus the audience was referred to work by O. Tamm and S. A. Waksman.

In addition to the inorganic elements previously mentioned, trace elements lately received emphasis, particularly since the realization of the essential role of traces of manganese. Upwards of fifty elements have been determined in some soils, perhaps there are at least as many in all soils. Boron is necessary in small quantities for the normal growth of many, if not all, plants and only slightly greater concentrations cause plant damage. Similar statements can be made for other trace elements; for example, zinc. Considerable work has been done on injury to plants and feeding animals, due to arsenic, aluminum, selenium, and nickel.

In conclusion mention was made of Ostwald Shriner's isolation of certain organic compounds from soils which may act in plant metabolism in a way analagous to the role of vitamins in the animal kingdom.

Abstracted by
Floyd T. Tyson, F.A.IC.

Washington

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Secretary-treasurer, Royal E. Rostenbach

319 North Quincy Street, Apt. 1

Arlington, Virginia

Council Representative, Walter J. Murphy

Reporter to THE CHEMIST, T. H. Tremearne

THE third meeting of the season was held by the Washington Chapter on Wednesday, April 18, 1945, at the Wardman Park Hotel. The chief feature was an address by Mr. C. A. Rishell, director of research, The Timber Engineering Co., Washington, D. C. This address was one of the most interesting ever presented before the Chapter and dealt with the subject of chemical materials being won from waste wood products, and the recent development in the field of wood technology. Mr.

Rishell built his talk around an exhibit of various resin-treated, molded, and laminated articles prepared from wood.

The Timber Engineering Company is a relatively new organization, sponsored by the lumber industry, and maintains a laboratory in Washington for the purpose of translating theoretical research into practical channels. Its research centers around the knowledge of chemists who have brought the German technological processes to this country. One of the chief processes is the hydrolysis of wood with sulfuric acid (Scholler Process) for the production of alcohol. As a result of the research of this organization, a $2,000,000 plant is being erected on the Pacific Coast to produce alcohol from waste sawdust.

Another important segment of research concerns the lignin remaining after the extraction of the cellulose from wood. It is believed that if a profitable market can be found for the lignin, for example in the field of plastics, the economics of alcohol production from wood will be on as sound a commercial basis as its production from molasses.

The Washington Chapter has been invited to visit the new laboratory of Mr. Rishell's organization where pilot-plant operations are conducted.

Western Pennsylvania

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Secretary-Treasurer, Jacqueline S. Front

Mellon Institute of Industrial Research

Pittsburgh 13, Penna.

Council Representative, William H. Hill

Thews Now Manager Of Sales For Titanium

Karl B. Thews, F.A.I.C., formerly chief development engineer of the Chemical Division of The Titanium Alloy Manufacturing Company, of New York and Niagara Falls, has been made manager of sales and chief development engineer of that company.

Thomas Elected Vice President Of Monsanto

Charles Allen Thomas, F.A.I.C., has been elected vice-president of the Monsanto Chemical Company, 1700 South Second Street, St. Louis, Missouri. Dr. Thomas was formerly director of the Central Research Department of that company at Dayton, Ohio.

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PROTECTIVE AND DECORATIVE COATINGS. Prepared by staff of specialists under editorship of Joseph J. Mattiello, F.A.I.C., Office of Quartermaster General. *Government Printing Office,* Washington, D. C. 1945. 349 pp.

This book is a compilation of lectures presented to the Plastic Section of the Research and Development Branch of the Military Planning Division of the Office of the Quartermaster General. It should not be confused with another series of books which bears the same title and is published in five volumes by John Wiley and Sons, Inc.

The lectures, as originally presented, were given by specialists in their respective fields. They have been ably edited by J. J. Mattiello, who is well-known for his contributions in the field of protective coatings. The lectures reflect a comprehensive grasp of the subject under discussion.

The book is profusely illustrated with diagrams, tables, and illustrative photographs. The subjects under discussion are exceedingly diverse and cover the essential subjects corollary to protective and decorative coatings.

Because of the very nature of the lecture material, it is felt that the book fulfills a need which has existed for some time in this field. It may be highly recommended to the student or beginner in this subject, as well as to those who have long-standing acquaintance with the field.

A considerable number of references have been included at the end of the lectures where necessary, and the index indicates that much care has been taken in its preparation. Theoretical considerations have been fully presented, where such explanation has been necessary to a clearer understanding of the practical appplications of coatings. But practice and theory in general have been well-proportioned so that the book presents a clear exposition of the general subject.

The subject matter covers the various types of vehicles, solvents, pigments, and driers. The physical construction of the materials to be coated has also been given attention, a subject which is sometimes unfortunately neglected in books of this type.

—John B. Rust, F.A.I.C.

INTRODUCTORY GENERAL CHEMISTRY. By Stuart R. Brinkley, F. A. I. C., Associate Professor of Chemistry, Yale University, Third Edition. *The Macmillan Company,* New York. 1945. 6″ x 8½″. vii 645pp. $4.00

This is an excellent book, up-to-

date and well written. Shorter than many texts, it offers one that rarity, the possibility of covering more than two-thirds of a book in a freshman course.

In general, the order of material is satisfactory and logical. The second chapter brings in atomic theory, atomic and molecular weight, the mole, valence, etc. A student who has had high school chemistry will not find this easy; certainly, others should skip a part and return to it after studying some descriptive chemistry.

The Periodic System is followed by Atomic Structure which leads to Ionization; the dispersal of an ionic lattice in water precedes the Arrhenus Theory. The Bronsted definitions of acids and bases are used throughout, for example, to explain hydrolysis.

Equilibrium is emphasized; constants of solubility, ionization and equilibrium are applied rather more than is usual. Amphoteric properties are explained on the basis of hydrated ions.

There is a good chapter on electrochemistry. Organic chemistry requires two well organized chapters. The long form of the Periodic Table is on the inside back cover. Problems are collected just before the appendix; a science major should solve nearly all of them.

If space were available, it would be desirable to emphasize that concentration changes may cause apparent violation of the displacement series, to include illustrations of more industrial processes and pictures of scientists (there is seldom time to look them up outside), and to touch on chemical economics.

Only a few errors were noticed: Avogadro's Number is now 6.02x 1023 (why use the decimals anyway with beginners?); the International Critical Tables' erroneous value of 110° for constant boiling hydrochloric acid is repeated.

This book, modern, containing all essentials but lacking some details, gives an instructor opportunity for, and requires, effective teaching and use of experience and imagination. It is a clear presentation of fundamentals.

—Paul Allen, Jr., F.A.I.C.

SOME ASPECTS OF THE AMERICAN CHEMICAL INDUSTRY. Dr. Henry F. Palmer and Dr. George E. P. Smith, Jr. Publication of the *Research Laboratories* of *The Firestone Tire and Rubber Company*. Akron, Ohio. 56pp.+separate charts.

This survey of the chemical industry in pamphlet form covers the introduction and history of the American chemical industry, its growth, statistics, raw materials, processes and

products, with appropriate references.

In the section on statistics are tables giving the thirty-eight chemical companies on which financial data are based; the chemical industry combined balance sheet — assets and liabilities; the combined totals; industry-total statistics; consumption of chemicals by industries, and other information. Separate charts cover "The Seven Basic Raw Materials", "Chemical Industry Based on Petroleum and Natural Gas", and "Chemical Industry Based on Coal". Photographs of chemical equipment are also included.

This is a scholarly, excellent and brief survey of the American chemical Industry. Readers of THE CHEMIST may obtain copies, without charge, by requesting them from the Research Department of The Firestone Tire and Rubber Company, Akron, Ohio.

"World Trade Routes", listing arrivals and departures of all merchant ships operating in the Atlantic, may now be obtained for 25 cents from the New York Journal of Commerce, 63 Park Row, New York 15, N. Y.

Raymond Szymanowitz, F.A.I.C., is author of "Colloidal Graphite and its Uses in the Glass Industry", which appeared in the March issue of *The Glass Industry*.

To The Editor:

In your December issue, 1944 you reviewed *Fundamentals of Chemistry*, by Monroe Offner—A New Home Library book which sells for 69 cents. Your reviewer referred to this book as a "reprint of a textbook." This book is an original publication written especially for the New Home Library and printed to sell for 69 cents, that it may be readily available to everyone . . . The purpose is to bring worthwhile books to the public at very low cost.

It is, of course, very natural to assume that a 69 cent book is a reprint —and yours is not the only publication to make the mistake! Since, however, Mr. Offner's book is new, I am sure he would appreciate your printing a correction.

—Louise S. Thomas,
The New Home Library.

Formula Wanted

WANTED: A reliable formula for synthetic perspiration for use in testing materials for resistance to perspiration. Please send information to Library of Industrial Research, 415 North Dearborn Street, Chicago 10, Illinois.

In science, as in politics, society pays a high price for forgetting the lessons of yesterday in its concern for tomorrow.

—A.A.A.S. Bulletin

Progress Through Science

Those who think of science as a cold ruthless machine that has been perverted to the cause of destruction will do well to consider the message given by John W. Thomas, chairman of the Firestone Tire and Rubber Company, at the recent meeting of the American Institute of Chemists. In layman's language Mr. Thomas envisioned a world wherein the benefits of science and research would make wars unnecessary. He said: "If every nation could possess within its boundries all of the raw materials it needs to live and to prosper, there would be little, if any, cause for war. I am convinced we are slowly but surely approaching the time when this fascinating dream may at least in part become a reality through the medium of sceintific research. Men now living may well see the day when a nation's true hidden wealth will not consist of her natural raw materials, but rather consist of her men of science and their laboratories."

Science has already started along trails that lead to vast new frontiers. If we agree that the principles of the Atlantic Charter can serve as a guide to a better world, in which men irrespective of race, color or creed can dwell without the dread specter of war, it seems logical that the men of science can blaze the trail. The same scientific intelligence that has guaranteed victory in this fight against the spirit of evil can be applied to making life better for all mankind. Editorial — *The New York Times*

To The American Institute of Chemists:

I am particularly pleased with the Code of Ethics of the Institute. The very first paragraph of this Code indicates that members of this Institute assume a responsibility of high degree; that it, to be useful to and to merit the respect of their fellowmen as well as to conduct their business, or practice their profession, on the Golden Rule basis.

The Rotary Club has a similar Code which is printed on about letter-size paper. It has a suitable heading with the Club's emblem Members are supposed to display this Code in their offices.

I believe it would be nice if the INSTITUTE would follow the Rotary Club's example in this regard. I am sure members would be pleased to meet the expense of preparing such a copy of the Code.

—Harry F. Lichtenberg, F.A.I.C.

The Illinois Institute of Technology, Chicago, will erect a $600,000 chemical engineering building, and a $350,000 chemistry unit, as a part of its new $10,000,000 campus program.

Chemical Condensates

The Japs claim that they have stepped up the alcoholic content of apple cider to the point where is is "usable as airplane fuel." That may account for the fact that the Japs have trouble in staying in the air.

The spirit of the American chemical industry is aptly described by the words, "the difficult we do immediately, the impossible takes a little longer."

Ready-colored eggs have been produced, at the U. S. Experiment Station at Beltsville, Md., by feeding organic dyes to chickens. When fed Sudan III, the hen produces an egg with a colored shell, whereas the feeding of a purple dye results in the production of an egg with a green yolk.

Tomato plants grow and have the best fruit-set when they are kept at about 78.8°F. during the day and 59-64.4°F. during the night, according to Professor Went of C.I.T.

According to the *London Graphic* of June 13, 1885, General Thayer was authorized by the U. S. Army Ordnance Board to produce a compressed - air, jet - propelled, bomber - ballon.

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When 2, 4 - dichlorophenoxyacetic University. The Medal carrier a acid is applied to lawns and grass plots to the extent of five gallons of a solution, containing one part in two thousand, per 1,000 square feet of plot, the weeds are destroyed without injury to blue grass. Relatively resistant weeds include broadleaf plantain, crabgrass, daisy, sheep-sorrel, and yarrow, whereas the treatment is effective against broadleaf dock, chickweed, dandelion, knotweed, lawn pennywort, narrow-leaf plantain, pigweed, and wood-sorrel.

In 1800 A.D. in Europe there were 18 regularly printed languages whereas today there are 53.

The United States per capita cost of World War II up to June 30, 1946 is placed at $3,251.

The fertile egg of *helvolus* wasp produces a female, whereas an unfertile egg produces a male.

The Responsibility of Science

After the war, what course will organized science chart for its future conduct? Will it busy itself adding to the sum of human knowledge, feeling that it has thereby made its full contribution to social progress? Will it retreat beyond the veil of semi-mysticism which even today largely obscures it? Or will it demand a voice in determining the use which shall be made of the products of its minds and talents?

There is an old admonition "Shoemaker, stick to your last." I respectfully suggest that Science has stuck too closely to its last, and that it is high time that this powerful group of thinking, creative men and women make their influence felt, not only in science and technology, but in the councils of the world as well.

—H. R. Hanmer, F.A.I.C.

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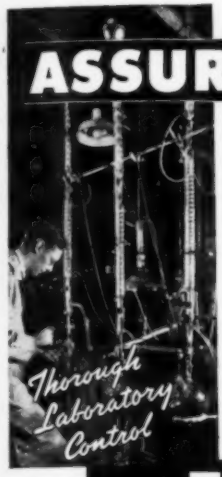

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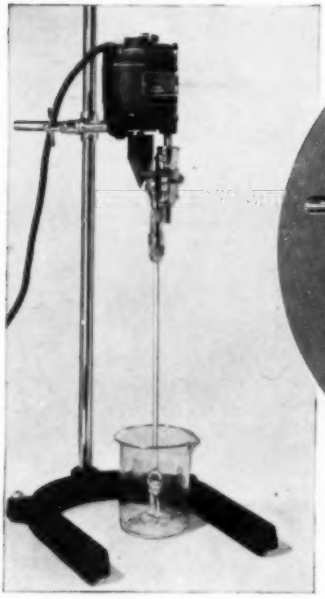

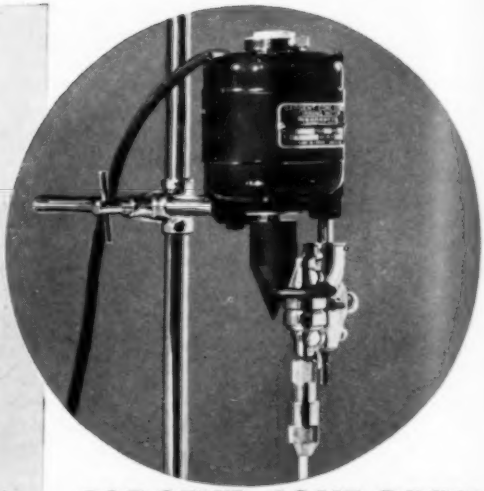

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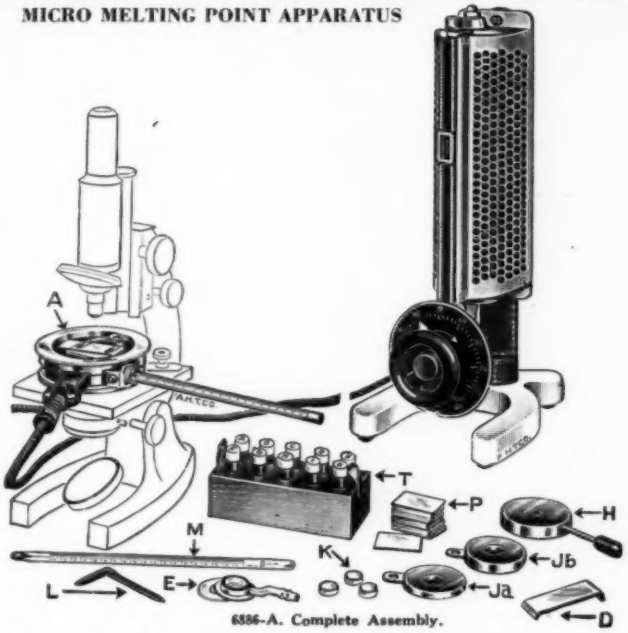

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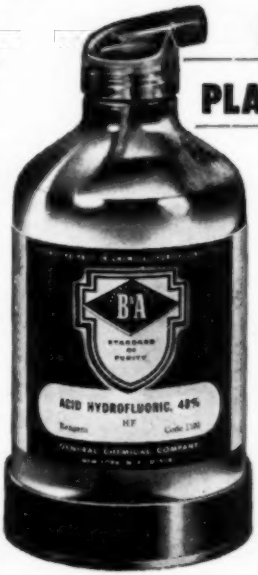

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